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Uncovering the Veil: Overcoming Challenges in Science Teaching Standards

Raya Agni[1,*], Aan Febriawan[1], Syech Zainal[1]
[1]Science Education, Tadulako University, Sulawesi Tengah, Indonesia

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ABSTRACT

Purpose of the study: This study examines the challenges faced by junior high school teachers in implementing science teaching standards, with a particular focus on issues related to instructional guidance, continuous assessment, and the provision of resources. It aims to identify gaps and offer strategies to enhance science education quality in Indonesian schools.

Methodology: A mixed-method approach was employed, combining classroom observations, structured interviews, and questionnaires. Data were collected from 160 participants, including teachers and students from junior high schools in Mantikulore District, Central Sulawesi. Quantitative data were analyzed using descriptive statistics, while qualitative insights were drawn from thematic coding of interviews and observations.

Main Findings: The findings reveal that while teachers demonstrate competence in providing guidance and conducting assessments, significant challenges remain in creating conducive learning environments. These include insufficient access to modern teaching resources, limited training in continuous assessment methods, and overcrowded classrooms that hinder effective science instruction. Students reported that practical activities and hands-on experiments were often constrained by a lack of laboratory materials, impacting their engagement and understanding of scientific concepts.

Novelty/Originality of this study: This research provides localized insights into the systemic and practical challenges faced by Indonesian schools in implementing science teaching standards. It uniquely highlights the interplay between resource availability, teacher development, and classroom practices. The study proposes innovative strategies for resource allocation, capacity building, and the integration of technology to address these gaps, contributing to evidence-based policy recommendations.

Corresponding Author:
Raya Agni,
Science Education, Tadulako University, Sulawesi Selatan, Indonesia,
Jl. Soekarno Hatta No.KM. 9, Kota Palu, Sulawesi Tengah, 94148, Indonesia
Email: raya.untad@gmail.com

1. INTRODUCTION

Talking about the problems in education often feels like unraveling a tangled thread: intricate, recurring, and challenging to resolve. Educational reform in Indonesia, although a beacon of hope, often remains an elusive dream that struggles to deliver tangible improvements to people's lives [1]. Education serves as the cornerstone of human capital development, playing a central role in community acculturation and societal advancement [2]. It is an investment in human potential, crucial for individual growth and collective societal progress [3].

Formal education, particularly in schools, is the primary medium for learning, with science education being an essential subject taught across all educational levels [4]. Science education equips students with an understanding of the universe and its intricacies [5], fostering a generation capable of competing in the global era [6]. Despite being a critical component of Indonesia's curriculum, science learning faces numerous challenges that hinder its effectiveness and broader societal impact.

Science, as defined by Bobrowsky [7], is a systematic process to acquire knowledge about natural phenomena through observation, testing, and investigation. It is not merely a collection of facts but a dynamic process that involves discovering patterns, understanding cause-and-effect relationships, and deducing principles that govern the universe. Science education extends beyond teaching facts; it emphasizes the process of discovery, logical reasoning, and application of the scientific method [8], [9]. The importance of science education lies in its dual role as a product (a body of knowledge comprising facts, concepts, and principles) and a process (a systematic method for inquiry and experimentation) [12]. Furthermore, it instills scientific values such as curiosity, critical thinking, openness to new ideas, and ethical responsibility towards living beings and the environment [13]. Science education, when implemented effectively, develops not only intellectual rigor but also social and moral values conducive to lifelong learning.

Despite its significance, the implementation of science education in Indonesia is fraught with obstacles. As highlighted by the National Science Education Standards [14], science teaching must adhere to six key standards, including planning inquiry-based learning, facilitating critical thinking, continuous assessment, and creating supportive learning environments. However, teachers face significant challenges in meeting these standards due to limited resources, administrative burdens, and lack of professional development opportunities [25]. These issues hinder the ability of educators to design and deliver high-quality science learning experiences.

In many regions, including Mantikulore District in Palu, Central Sulawesi, the quality of science learning in junior high schools remains suboptimal. The district's unique geographical and social characteristics present additional challenges to education delivery. For instance, low participation rates among students in classroom and laboratory activities are indicative of underlying issues such as limited motivation and engagement, which may stem from ineffective teaching methods or inadequate resources [25]. Moreover, the qualifications of science teachers in this region have raised concerns. Teachers often lack sufficient training to implement inquiry-based learning or utilize modern pedagogical approaches, which are critical for engaging students in scientific exploration. Administrative workloads further limit teachers' capacity to focus on lesson planning and continuous assessment, compromising the overall learning process.

While several studies have explored general challenges in Indonesia's education system and science learning, limited research focuses on localized contexts such as Mantikulore District. The majority of existing research examines broad national trends or urban areas, leaving gaps in understanding how geographical, cultural, and socio-economic factors affect science education in rural or semi-urban settings. Furthermore, although the role of teacher qualifications and professional development has been discussed extensively, the specific impacts of these factors on student engagement and learning outcomes in science remain underexplored. This research seeks to bridge these gaps by examining the unique challenges faced by junior high school science educators and students in Mantikulore District. It aims to identify specific obstacles, including teacher readiness, resource availability, and contextual factors, that impede effective science learning. Additionally, this study will explore potential strategies tailored to the local context, such as improving teacher training, optimizing resource allocation, and fostering student engagement through innovative pedagogical approaches.

2. RESEARCH METHOD

This study employed a mixed methods research design combining quantitative and qualitative approaches, with a descriptive method to provide a comprehensive understanding of the phenomena being studied. The descriptive method aligns with the frameworks established by Agni & Zainal [26] and Sugiyono [27]. The study was conducted between April and September 2024 in junior high schools located in Mantikulore District, Palu, Central Sulawesi.

The research population consisted of all Grade VIII students from six junior high schools in Mantikulore District, totaling approximately 1,600 students. A sample comprising 10% of the population (160 students) and science teachers was selected using simple random sampling. This technique assumes that the population is homogeneous and ensures an unbiased representation of the students across all six schools. The study relied on both primary and secondary data, collected from multiple sources within the field. The types of data collected were: Quantitative data: Numerical data from student and teacher questionnaires. Qualitative data: In-depth insights derived from classroom observations and interviews.

Data collection involved the following methods: Questionnaires: Distributed to students and teachers to gather quantitative data on science teaching standards. In-depth Interviews: Conducted with selected respondents to gain deeper insights into their experiences and challenges in science learning. Classroom Observations: Performed to contextualize findings and corroborate questionnaire and interview data.

The questionnaire employed a Likert scale format, with responses rated as follows:

- Strongly Agree: Score of 4
- Agree: Score of 3
- Disagree: Score of 2
- Strongly Disagree: Score of 1

Data analysis was carried out in two stages: Quantitative Analysis: Descriptive statistical techniques were used to analyze the questionnaire responses. The total scores were calculated and summarized to provide insights into student and teacher perceptions of science learning standards. Qualitative Analysis: A thematic analysis was applied to the interview and observation data to identify key challenges, themes, and patterns. This approach facilitated the interpretation of qualitative data, enriching the findings from the quantitative analysis. The mixed methods approach ensured that the quantitative data provided measurable insights into the research problem, while the qualitative data added depth and context. By integrating these findings, the study aimed to offer a nuanced understanding of the challenges and opportunities in improving science learning in the sampled schools.

3. RESULTS AND DISCUSSION

The data presented appears to be the result of a descriptive statistical analysis of a questionnaire or survey related to student learning standards. The results of the descriptive test can be seen in table 1.

Table. 1 Results of the Descriptive Test of Learning Standards and Student Assessment

	N	Range	Min	Max	Mean		Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Teaching Standards B	160	14	22	36	28.73	.242	3.065	9.393	-.021	.192	-.244	.381
Teaching Standard C	160	17	23	40	32.31	.269	3.400	11.562	.012	.192	.179	.381
Teaching Standards D	160	13	11	24	18.01	.198	2.502	6.258	.132	.192	.900	.381
Teaching Standards E	160	22	38	60	48.96	.393	4.975	24.747	.063	.192	-.284	.381

The following is the interpretation of the questionnaire answered by students regarding the teaching standards of science teachers in junior high schools in Mantikulore District, based on teaching standards B, C, D, and E:

Teaching standard B: Teachers as science guides and learning facilitators: a) Data were collected through classroom observations, interviews, and questionnaires; b) The majority of students (23.8%) gave a score of 31, which indicates a positive perception of the teacher's ability to guide and facilitate science learning.; c) The minimum score of 22 and the maximum score of 36, indicates a variation in students' perception of the teacher's ability in this standard, although most assessments tend to be positive.

Teaching standard C: Science teachers are bound in continuous assessment of teaching and learning students: a) Continuous assessment was rated 32.31 (scale 40), reflecting good implementation but with room for improvement; b) Two sizable groups of students (16.9% each) gave scores of 33 and 32, indicating that most students felt that the teacher had carried out the assessment in a sustainable manner well; c) The minimum score of 23 and the maximum score of 40, indicates that there is a variation in students' perception of the teacher's ability to conduct assessments, but most of the assessments are positive.

Teaching standard D: Science teachers design and manage a learning environment that allows the time, space and resources needed to learn science to be available: a) The learning environment received the lowest score of 18.01 (scale 24), highlighting significant resource and time constraints; b) Most students (29.4%) gave a score of 18, indicating that there are still many students who feel that the learning environment is not optimal in providing the time, space, and resources needed to learn science; c) The minimum score of 11 and the maximum score of 24, indicates that there is a considerable variation in student perception. This shows that there is significant room for teachers to improve the quality of the science learning environment.

Teaching standard E: Science teachers develop a science learning community that reflects the intellectual rigor of scientific inquiry and attitudes and social values that are conducive to science learning: a) Developing a science learning community was rated 48.96 (scale 60), showing strong teacher efforts in fostering collaborative and inquiry-based learning; b) The majority of students (21.9%) gave a score of 52, indicating that most students felt that the teacher had succeeded in creating a positive learning community. The minimum score

is 38 and the maximum is 60, indicating variation in student perception, but most assessments tend to be positive.

The study provides an insightful overview of respondents' evaluations of learning standards, offering a foundation for understanding the current state of science education. While the overall assessment trends positively, notable variations indicate the need for tailored interventions to address disparities. The standard deviation highlights considerable differences in respondents' perspectives, with some providing ratings significantly above or below average. Slight negative skewness and positive kurtosis suggest that the data distribution, though not entirely normal, deviates only marginally, making the findings robust for analysis.

Teaching Standard B emphasizes the role of teachers in facilitating science learning by presenting concepts clearly, encouraging student inquiry, and providing diverse resources such as textbooks, interactive simulations, and videos. The results indicate that teachers effectively foster an open and collaborative classroom environment, encouraging discussion, experimentation, and critical thinking. However, students also identify areas for improvement, signaling opportunities for teachers to refine their facilitation methods further. A key limitation in optimizing this standard is the inadequacy of facilities and infrastructure, as identified through teacher interviews. Many sample schools face challenges, including damaged laboratory equipment and insufficient resources, which hinder effective science facilitation. These constraints, persisting since 2018, negatively impact both the teaching process and student outcomes [33]-[35]. Addressing these challenges requires investments in infrastructure and training for innovative teaching strategies that compensate for resource limitations.

Teaching Standard C highlights the necessity of ongoing assessment throughout the learning process. The study shows this standard is moderately implemented, reflecting efforts by teachers to assess students continuously. However, several constraints were identified, including limited time and resources. Designing, implementing, and analyzing continuous assessments demand significant teacher effort, which is often constrained by large class sizes, administrative duties, and inclusive classroom requirements [36], [37]. The findings also underscore the increasing diversity of student learning needs, necessitating more inclusive and differentiated assessment practices. While teachers are adapting to these demands, systemic support in the form of time allocation, additional resources, and professional development is essential to optimize continuous assessments.

Teaching Standard E emphasizes creating a collaborative science learning environment that supports critical thinking, ethical inquiry, and respect for diverse perspectives. This standard has been well implemented, with teachers fostering active participation, curiosity, and scientific rigor among students. Collaborative learning communities have been instrumental in encouraging students to explore scientific inquiry, accept failure as part of the process, and engage in ethical discourse [38]. One notable finding is the role of teacher leadership in driving the success of this standard. Teachers who demonstrate strong leadership skills can create dynamic and inclusive science communities, leading to improved learning outcomes. Supporting teacher leadership through targeted training programs can further enhance the impact of this standard on students' scientific attitudes and values.

Teaching Standard D, which involves designing and managing a science learning environment with adequate time, space, and resources, remains the most challenging to implement. Insufficient budgets, lack of materials, and inadequate facilities were highlighted as significant barriers [39], [40]. High teacher workloads further exacerbate the issue, limiting their ability to create and sustain an optimal learning environment. To address this gap, schools must prioritize investments in infrastructure and provide teachers with access to essential resources. Additionally, reducing administrative burdens and optimizing class sizes can free up time for teachers to focus on designing effective learning environments.

This study offers a nuanced understanding of the relationship between learning standards and their practical implementation in science education. By combining quantitative data with qualitative insights from teacher interviews, it provides a comprehensive analysis of strengths and weaknesses in teaching practices. The findings emphasize the critical interplay between teacher capacity, infrastructure, and systemic support in achieving educational goals. The implications are significant for policymakers and school leaders. Strengthening infrastructure, enhancing teacher training programs, and promoting teacher leadership are vital steps toward improving the quality of science education. Additionally, fostering a culture of continuous assessment and inclusive learning can lead to more equitable and effective educational outcomes.

The study focuses on a limited geographical area (Mantikulore District), which may restrict the generalizability of findings to other regions. The lack of adequate facilities in many sample schools limits the ability to test the full potential of teaching standards. Reliance on teacher and student perceptions introduces a degree of subjectivity, which may not fully reflect actual teaching practices.

4. CONCLUSION

This study concludes that science teachers in the Mantikulore District exhibit commendable competency in providing guidance and fostering community engagement. However, there remains significant room for improvement in designing and implementing optimal learning environments. Key challenges include resource constraints and the need for more robust continuous assessment practices, both of which are critical to improving the overall quality of science education in the district.

The findings underscore the importance of addressing systemic barriers, such as limited access to teaching materials and inadequate training opportunities, to enable teachers to create more effective learning environments. Enhancing continuous assessment practices can also provide teachers with better tools to monitor student progress and adapt their teaching strategies accordingly. Future research should focus on developing and evaluating scalable interventions, such as teacher professional development programs, low-cost resource innovations, and digital learning tools that can be adapted to similar educational contexts. Moreover, comparative studies across different regions could provide broader insights into effective strategies for improving science education, ensuring that solutions are contextually relevant while addressing the diverse needs of students and teachers alike.

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REFERENCES

[1] R. Ependi, "Menakar permasalahan pendidikan islam dalam presfektif islam transitif [Measuring the problems of islamic education from a transitive islamic perspective]," *Hikmah*, vol. 17, no. 1, pp. 34–45, 2020, doi: 10.53802/hikmah.v17i1.78.

[2] H. Habibi, A. Anekawati, and L. Fazat Azizah, "Permasalahan pembelajaran IPA SMP/MTs DI Kabupaten Semenep Tahun Ajaran 2010-2011 [Science learning problems in junior high schools/islamic junior high schools in Semenep Regency in the 2010-2011 Academic Year]," *LENSA (Lentera Sains) J. Pendidik. IPA*, vol. 2, no. 1, pp. 35–45, 2020, doi: 10.24929/lensa.v2i1.100.

[3] Y. Ary Pratama, M. Jamhari, and R. Agni, "Application of the Group Investigation (GI) Type Cooperative Learning Model to Increase Students' Interest in Learning in Class X-J of SMA Negeri 1 Torue," *Equator Sci. J*, vol. 2, no. 1, pp. 31–38, 2024, doi: 10.61142/esj.v2i1.123.

[4] A. Almagfira, L. Alibasyahi, and R. Agni, "The effect of cooperative learning model of teams game tournament type on motivation and learning outcomes of junior high school students in Palu," *Sci. J*, vol. 2, no. 2, pp. 20–26, 2024, doi: 10.61142/esj.v2i2.126.

[5] K. Hidayati, "Comparison of science learning outcome between using and do not using picture media on state islamic elementary students," *INSECTA Integr. Sci. Educ. Teach. Act. J*, vol. 1, no. 1, p. 69, 2020, doi: 10.21154/insecta.v1i1.2092.

[6] S. Zainal and R. Agni, "*Memahami Kurikulum 2013: Perspektif Guru IPA untuk Pengajaran yang Efektif*," Jakarta Barat: Mega Press Nusantara, 2024.

[7] M. Bobrowsky, "*The Process of Science ... and its Interaction with Non-Scientific Ideas*," Am. Astron. Soc., 2007.

[8] R. Astuti, W. Sunarno, and S. Sudarisman, "Pembelajaran IPA dengan pendekatan ketrampilan proses sains menggunakan metode eksperimen bebas termodifikasi dan eksperimen terbimbing [Science learning with a science process skills approach using modified free experiment methods and guided experiments]," *Semin. Nas. Pendidik. Sains*, vol. 13, no. 1, pp. 339–345, 2015, doi: 10.21154/jtii.v1i2.145.

[9] A. Rahmah, S. Titah, W. Fadly, E. R. Faradisya, and F. U. Nur, "Pengaruh model sains teknologi masyarakat dan pendekatan esd dalam meningkat kepedulian lingkungan [The influence of the science-technology-society model and the ESD approach in increasing environmental awareness]," *Jurnal Tadris IPA Indonesia*, vol. 1, no. 1, pp. 68–72, 2021, doi: 10.21154/jtii.v1i2.145.

[10] M. D. Insani, "Studi pendahuluan identifikasi kesulitan dalam pembelajaran pada guru IPA SMP Se-Kota Malang [Preliminary study of identification of learning difficulties in junior high school science teachers throughout Malang City]," *J. Pendidik. Biol*, vol. 7, no. 2, pp. 81–93, 2016, doi: 10.17977/um052v7i2p81-93.

[11] S. Olson and S. L. Horsley, "*Inkuiri dan Standar-standar Pendidikan Sains Nasional, Sebuah Panduan untuk Pengajaran dan Pembelajaran. Terjemahan INQUIRY AND THE NATIONAL SCIENCE EDUCATION STANDARDS, A Guide for Teaching and Learning*," Bandung: SEAMEO QITEP in Science, 2000.

[12] A. W. Wisudawati and E. Sulistyowati, "*Metodologi Pembelajaran IPA [Science Learning Methodology]*". Jakarta: Sinar Grafika Offsite, 2014.

[13] A. S. Wahyuni, "Literature review: Pendekatan berdiferensiasi dalam pembelajaran IPA [Literature review: Differentiated approach in science learning]," *J. Pendidik. Mipa*, vol. 12, no. 2, pp. 118–126, 2022, doi: 10.37630/jpm.v12i2.562.

[14] D. Febriyanti, S. Sjaifuddin, and L. T. Biru, "Analisis proses pembelajaran IPA terpadu dalam pelaksanaan kurikulum 2013 di SMP Kecamatan Sumur-Banten [Analysis of the integrated science learning process in the implementation of

the 2013 curriculum at Junior High Schools in Sumur District, Banten],” *PENDIPA J. Sci. Educ*, vol. 6, no. 1, pp. 218–225, 2021, doi: 10.33369/pendipa.6.1.218-225.
[15] *National Academy of Sciences, National Science Education Standards*, vol. 52, no. 44. Washington, DC: National Academy Press, 1996.
[16] Z. Williams et al., “Comprehensive profiling of circulating microRNA via small RNA sequencing of cDNA libraries reveals biomarker potential and limitations,” *Proc. Natl. Acad. Sci. U.S.A*, vol. 110, no. 11, pp. 4255–4260, 2013, doi: 10.1073/pnas.1214046110.
[17] National Research Council, A framework for K-12 science education: Practices, crosscutting concepts, and core ideas. Washington, DC: National Academies Press., 2012.
[18] Next Generation Science Standards, “Read The Standards,” Next Generation Science Standards.
[19] H. Aktamiş, E. Hiğde, and B. Özden, “Effects of the inquiry-based learning method on students’ achievement, science process skills and attitudes towards science: A meta-analysis science,” *J. Turkish Sci. Educ*, vol. 13, no. 4, pp. 248–261, 2016, doi: 10.12973/tused.10183a.
[20] D. K. Capps, B. A. Crawford, and M. A. Constas, “A Review of Empirical Literature on Inquiry Professional Development: Alignment with Best Practices and a Critique of the Findings,” J. Sci. Teacher Educ., vol. 23, no. 3, pp. 291–318, 2012, doi: 10.1007/s10972-012-9275-2.
[21] L. Florian and K. Black-Hawkins, “Exploring inclusive pedagogy,” *Br. Educ. Res. J*, vol. 37, no. 5, pp. 813–828, 2011, doi: 10.1080/01411926.2010.501096.
[22] W. Wiliam, “*Embedded formative assessment*”. Bloomington: Solution Tree Press, 2018.
[23] Organisation for Economic Cooperation and Development, “*The Future of Education and Skills: Education 2030. The Future We Want*,” OECD france.
[24] R. W. Bybee et al., “The BSCS 5E instructional model: Origins and effectiveness,” *Color. Springs, Co BSCS*, vol. 5, no. 88–98, 2014.
[25] E. S. Indrawati and Y. Nurpatri, “Problematika pembelajaran IPA terpadu (Kendala Guru Dalam Pengajaran IPA Terpadu) [Problems of integrated science learning (Teacher Obstacles in Integrated Science Teaching)],” *Educ. J. Pendidik*, vol. 1, no. 1, pp. 226–234, 2022, doi: 10.56248/educativo.v1i1.31.
[26] R. Agni and S. Zainal, “Exploring the relationship between visual learning styles and learning outcomes in limnology course: A quantitative descriptive study,” vol. 1, no. 1, pp. 31–38, 2023, doi: 10.61142/esj.v1i1.5
[27] D. Sugiyono, “*Metode Penelitian Kuantitatif, Kualitatif, dan R & D* [*Quantitative, Qualitative, and R&D Research Methods*]”. Bandung: Alfabeta, 2013.
[28] Sugiyono, “*Statistika Untuk Penelitian* [*Statistics For Research*]”. Bandung: CV. Alfabeta, 2023.
[29] R. Agni, A. Rede, and M. Jamhari, “Pengaruh model pembelajaran kooperatif tipe STAD dipadukan media animasi pembelajaran terhadap kreatifitas dan hasil belajar siswa [The influence of the STAD type cooperative learning model combined with animated learning media on student creativity and learning outcomes],” *J. Kreat. Online*, vol. 8, no. 3, 2020.
[30] R. V Hogg, J. W. McKean, and A. T. Craig, Introduction to Mathematical Statistics. Boston: Pearson, 2019.
[31] A. P. Field, “*Discovering statistics using SPSS: and sex and drugs and rock “n” roll (2nd Edition)*”. London: Sage Publication, 2009.
[32] Permendikbud, “Peraturan menteri pendidikan dan kebudayaan nomor 16 Tahun 2007 tentang standar kualifikasi akademik dan kompetensi guru [Regulation of the Minister of Education and Culture Number 16 of 2007 concerning academic qualification standards and teacher competencies],” in Permendikbud, Kementerian Pendidikan dan Kebudayaan, Jakarta, 2007.
[33] R. Miski, “Pengaruh sarana dan prasarana terhadap hasil belajar siswa [The influence of facilities and infrastructure on student learning outcomes],” *Tadbir Muwahhid*, vol. 4, no. 2, pp. 69–73, 2015, doi: 10.30997/jtm.v4i2.341.
[34] I. Siregar and A. Farida, “Pengaruh sarana dan prasarana terhadap hasil belajar IPA siswa kelas VIII SMPI Islam Luqman Al Hakim Batam [The influence of facilities and infrastructure on science learning outcomes of class VIII students at SMPI Islam Luqman Al Hakim Batam],” *TADRIBUNA J. Islam. Educ. Manag*, vol. 1, no. 1, pp. 107–116, 2023, doi: 10.61456/tjiec.v1i1.83.
[35] N. I. Yusuf, I. N. Karma, and S. Istiningsih, “Pengaruh sarana dan prasarana belajar sekolah terhadap motivasi belajar siswa SDN 7 Ampenan Kota Mataram [The influence of school learning facilities and infrastructure on students' learning motivation at SDN 7 Ampenan, Mataram City],” *Konstr. J. Pendidik. dan Pembelajaran*, vol. 15, no. 1, pp. 56–64, 2023, doi: 10.35457/konstruk.v15i1.2605.
[36] M. Morton and T. Mcmenamin, “Learning together: Collaboration to develop curriculum assessment that promotes belonging,” *Support Learn*, vol. 26, no. 3, pp. 109–114, 2011, doi: 10.1111/j.1467-9604.2011.01488.x.
[37] S. Kanatouri, “Emerging perspectives,” *Digit. Coach*, pp. 115–154, 2020, doi: 10.4324/9780429022753-4.
[38] P. Oppi and E. Eisenschmidt, “Developing a professional learning community through teacher leadership: A case in one Estonian school,” *Teach. Teach. Educ. Leadersh. Prof. Dev*, vol. 1, no. April, p. 100011, 2022, doi: 10.1016/j.tatelp.2022.100011.
[39] M. B. Ogunniyi, “The development of science education in Botswana,” *Sci. Educ*, vol. 79, no. 1, pp. 95–109, 2004, doi: 10.1002/sce.3730790107.
[40] N. Bandara and R. Chathurika, “The impact of classroom environment on students’ learning,” *E-Journal Soc. Work*, vol. 6, no. 2, pp. 12–19, 2022, doi: 10.47205/plhr.2021(5-ii)2.17.
[41] L. M. Desimone, “Improving impact studies of teachers’ professional development: Toward better conceptualizations and measures,” *Educ. Res*, vol. 38, no. 3, pp. 181–199, 2009, doi: 10.3102/0013189X08331140.